

WHAT IS CLAIMED IS:

1. A vertical routing structure inside a substrate for connecting a first trace line and a second trace line electrically, wherein the first trace line and the second trace line are located at a first surface and a corresponding second surface of a stack layer in the substrate, the vertical routing structure comprising:

a conductive rod that passes through the stack layer such that a first surface and a corresponding second surface of the conductive rod are exposed on the first surface and the second surface of the stack layer;

a first bonding pad on the first surface of the conductive rod,

10 wherein the first bonding pad is connected to the first trace line and that the transverse sectional area of the first bonding pad is smaller than the transverse sectional area of the first surface of the conductive rod; and

a second bonding pad on the second surface of the conductive rod,

wherein the second bonding pad is connected to the second trace line.

15 2. The vertical routing structure of claim 1, wherein the transverse sectional area of the second bonding pad is also smaller than the transverse sectional area of the second surface of the conductive rod.

3. The vertical routing structure of claim 1, wherein the stack layer includes a dielectric layer.

20 4. The vertical routing structure of claim 1, wherein the stack layer includes a plurality of dielectric layer and at least a patterned circuit layer, and the circuit layer is positioned between any two neighboring dielectric layers.

5. The vertical routing structure of claim 4, wherein the side edge of the conductive rod is electrically connected to the circuit layer.

6. The vertical routing structure of claim 4, wherein the side edge of the conductive rod is not electrically connected to the circuit layer.